# You Are What You Eat

## Objective

Students will identify the eating habits of a mammal using animal skulls and teeth.

## Method

Students examine animal skulls and teeth.

## California Standards

*Language Arts*:  Reading 2.7; Listening and Speaking 1.6 *Science*:  Life Science 2 b, 3 b, c; Investigation 6 a, c

## Materials

Time to complete:  one 50-minute period, activity pages (one per student), Replica skull from kit

## Background

The study of skulls and animals' teeth are an important part of a biologist's work. There are many reasons for close examination of a mammal skull.  Biologists learn much about the health, age, and relationships of mammals by studying their skulls.  The shape and size are important since the skulls are composed of many separate bones that fit together like pieces in a puzzle and vary according to the animal's particular lifestyle.  Biologists look for structures for muscle attachment, openings for nerves and blood vessels, and suture patterns (areas where the skull bones grow together).

However, the teeth have the most to say about a mammal and its lifestyle.  Mammals have developed an amazing array of teeth.  Each creature has evolved a mouthful of tools best suited to its special life style. Their number is important, but so are their shape and their location in the jaws.  Certain types of teeth may be absent in one species, but present in another.  All are important indicators of the animal's eating habits and are crucial for identifying the species.  There are four basic types of teeth: incisors, canines, premolars, and molars.

## Procedure

1.  Ask students if they have heard the expression "you are what you eat?"  Ask them to relate the statement to the shape and function of an animal's teeth.  Discuss their ideas.

2.  Provide each student with the activity page.  Have students read the information and then label the drawing of the skull.

3.  Have students compare the drawing with the replica skull in the kit.  Through their examination what information can be determined about the animal?  What types of teeth are present in the skull?  Is this animal an herbivore, carnivore, or omnivore?

## Extension

Have students create a dental formula for the replica skull.  Biologists use the number, type, and location of a mammal's teeth to determine a "dental formula."  An example of a dental formula for an animal with 50 teeth is:

|         | I  | C | P | M | Total |
|---------|----|---|---|---|-------|
| **Upper** | 10 | 2 | 6 | 8 | 26    |
| **Lower** | 8  | 2 | 6 | 8 | 24    |

The letters refer to the different kinds of teeth: incisors (I), canines (C), premolars, or bicuspids (P), and molars (M).  The numbers refer to the total number of teeth of each kind in both the upper and lower jaws.

## Evaluation

Have students match the profile of eating habits with the skull drawings on the Review activity sheet.

Activity adapted from "Wild in the Woods," *Virginia Wildlife Newsletter*, November 1998.

**Answers to Student Page:  A-3, B-5, C-4, D-2, E-1.**

# You Are What You Eat!

Why do mammals have so many different kinds of teeth? Because the diets of mammals are diverse, and different types of teeth are needed to process the various foods that mammals eat. Animals that feed only on plants are called herbivores (HER-bi-vore). Rabbits and squirrels are herbivores. Animals that feed only on animals are carnivores (KAR-ni-vore). Can you name a carnivore? Mountain lions are carnivores. There are very few true carnivores. Most humans are omnivores (OM-ni-vore). Omnivores eat both plants and animals. Most animals are omnivores. Bears are omnivores. Bears eat mostly plants but they also eat rodents, insects, and sometimes baby deer and fish. They even eat carrion (KAR-e-on); carrion means dead animals.

Animals that eat meat will have pointy teeth for ripping and tearing. An animal that eats only plants will have mostly flat teeth for grinding. Animals that eat both kinds of food, meat and plants, have an assorted set of teeth.

**Label the skull drawing**, as you do compare your own teeth with the drawing.

There are four basic types of teeth: incisors, canines, bicuspids (or premolars), and molars.

1. Incisors are big, flat, wedge-shaped teeth in the front of the jaw; they work much like scissors. The upper and lower teeth fit closely together like two blades and nip out neat bites of food.

2. Canines are on either side of the incisors. They are sharp, pointy teeth sometimes called dog teeth. These are used for gripping, tearing, and chewing meet off a bone.

3. Next are the bicuspids. This word means having two (bi) points (cusps). They are also known as premolars.

4. In the back are the flat molars. Molar means "millstone." Together the bicuspids and molars are the grinding department.

## A black bear is an __ __ __ __ __ __ __ __. Can you see why?
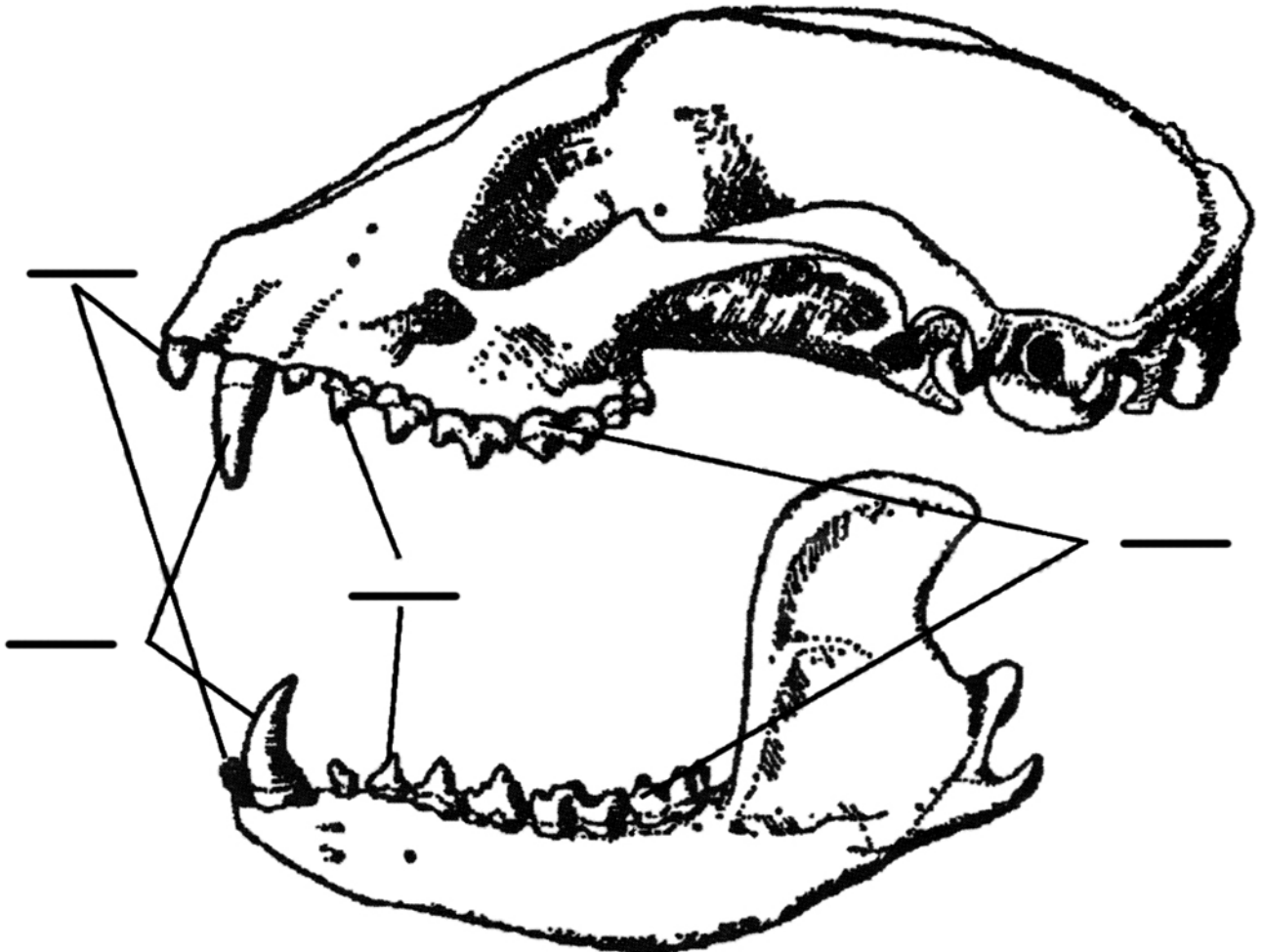
# You Are What You Eat!

*This review may help you match the eating habit profiles with the five mammal skull drawings.*

The teeth have much to say about a mammal and its lifestyle. Herbivores must chew their food well before swallowing, since plant material is difficult to digest. Generally, the premolars and molars are broad and flat for grinding plant material to a pulp. Most herbivores don't have canines because they don't need to grab moving prey. Omnivores eat both plant and animal food; their teeth and other skull characteristics show a combination of herbivore and carnivore features. Omnivores usually have a full set of teeth but their jaws and teeth are generally less specialized than those of carnivores or herbivores. Carnivores usually have a thick, heavy jaw with large surface areas and other features for muscle attachment.

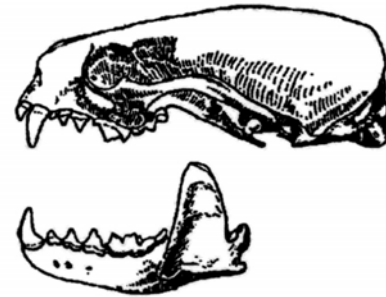**Match the following profiles to the correct skull.**

1.  DEER are herbivores, feeding on all kinds of vegetation. They are browsers whose molars have a jagged appearance and a well-adapted surface for grinding the tough plant fibers in vegetation.

2.  BATS are insectivores, a specialized kind of carnivore that eats insects such as moths, beetles, flies, and mosquitoes. Bats can consume as much as half their own weight in insects in one evening.

3.  OPOSSUMS are the only marsupial in North America; the female has a fur-lined pouch called a marsupium in which the young develop. The species was introduced into California and they eat just about anything edible. These omnivores are active at night eating insects, fruit, eggs, nuts, and garbage.

4.  RIVER OTTERS are aquatic mammals that live in streams and lakes. They feed on fish, frogs, and crayfish, as well as small birds and mammals. They are carnivores.

5.  BEAVERS are herbivores that leave evidence of their presence in the form of tooth-marks on downed logs and branches and on tree stumps chiseled out by their front teeth.

A. _____

B. _____

C. _____

D. _____

E. _____